

PATENT COOPERATION TREATY

corrected version

From the INTERNATIONAL SEARCHING AUTHORITY

PCT

To:

D YOUNG & CO
Attn. Haines, Miles J.
21 New Fetter Lane
London EC4A 1DA
UNITED KINGDOM

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL SEARCH REPORT AND
THE WRITTEN OPINION OF THE INTERNATIONAL
SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

	Date of mailing (day/month/year) 23/11/2004
Applicant's or agent's file reference P017376WO MJH	FOR FURTHER ACTION See paragraphs 1 and 4 below
International application No. PCT/GB2004/001877	International filing date (day/month/year) 30/04/2004
Applicant OHM LIMITED	

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

Filing of amendments and statement under Article 19:

The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

When? The time limit for filing such amendments is normally 2 months from the date of transmittal of the International Search Report; however, for more details, see the notes on the accompanying sheet.

Where? Directly to the International Bureau of WIPO, 34 chemin des Colombettes
1211 Geneva 20, Switzerland, Facsimile No.: (41-22) 740.14.35

For more detailed instructions, see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.
3. ☐ **With regard to the protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:
- ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.
- ☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. Reminders

Shortly after the expiration of **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.

The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. These comments would also be made available to the public but not before the expiration of 30 months from the priority date.

Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until **30 months** from the priority date (in some Offices even later); otherwise, the applicant must, within **20 months** from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months.

See the Annex to Form PCT/IB/301 and, for details about the applicable time limits, Office by Office, see the *PCT Applicant's Guide*, Volume II, National Chapters and the WIPO Internet site.

Name and mailing address of the International Searching Authority



European Patent Office, P.B. 5818 Patentlaan 2
NL-2280 HV Rijswijk
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Authorized officer

Luis-Miguel Paredes Sanchez

NOTES TO FORM PCT/ISA/220

These Notes are intended to give the basic instructions concerning the filing of amendments under article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the *PCT Applicant's Guide*, a publication of WIPO.

In these Notes, "Article", "Rule", and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions, respectively.

INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report and the written opinion of the International Searching Authority, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only (see *PCT Applicant's Guide*, Annexes B1 and B2).

The attention of the applicant is drawn to the fact that amendments to the claims under Article 19 are not allowed where the International Searching Authority has declared, under Article 17(2), that no international search report would be established (see *PCT Applicant's Guide*, Volume I/A, paragraph 296).

What parts of the international application may be amended?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

When?

Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

Where not to file the amendments?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

How?

Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Administrative Instructions, Section 205(b)).

The amendments must be made in the language in which the international application is to be published.

What documents must/may accompany the amendments?

Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference P017376WO MJH	FOR FURTHER ACTION <small>see Form PCT/ISA/220 as well as, where applicable, item 5 below.</small>	
International application No. PCT/GB2004/001877	International filing date (day/month/year) 30/04/2004	(Earliest) Priority Date (day/month/year) 10/06/2003
Applicant OHM LIMITED		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 6 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ The international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (See Box II).

3. ☒ **Unity of invention is lacking** (see Box III).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regards to the **drawings**,

a. the figure of the **drawings** to be published with the abstract is Figure No. 5

☒ as suggested by the applicant.

☐ as selected by this Authority, because the applicant failed to suggest a figure.

☐ as selected by this Authority, because this figure better characterizes the invention.

b. ☐ none of the figures is to be published with the abstract.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB2004/001877

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 G01V3/12

corrected version

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G01V

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 955 884 A (TABAROVSKY LEONTY A ET AL) 21 September 1999 (1999-09-21) column 3, line 8 - line 14 column 5, line 59 - column 6, line 25 column 7, line 8 - column 8, line 18 column 10, line 44 - column 11, line 3; figures 4,5	12,14
A	US 2003/048105 A1 (WESTERDAHL HARALD ET AL) 13 March 2003 (2003-03-13) paragraphs [0001], [0018], [0030] - [0032], [0037]	1,10-12
A	US 2003/043692 A1 (WESTERDAHL HARALD ET AL) 6 March 2003 (2003-03-06) paragraphs [0011], [0025] - [0031], [0040]; claims 1,3,5	5-8
	-/--	

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

18 November 2004

Date of mailing of the international search report

23 11. 2004

Name and mailing address of the ISA

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NL - 2280 HV Rijswijk
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Authorized officer

Lorne, B

INTERNATIONAL SEARCH REPORT

International Application corrected version
PCT/GB2004/001877

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 02/14906 A (REES DAVID CHRISTOPHER ; PEDERSEN HANS MAGNE (NO); EIDESMO TERJE (NO);) 21 February 2002 (2002-02-21) cited in the application claim 1 -----	1,10-12
A	US 4 258 322 A (ROCROI JEAN-PIERRE ET AL) 24 March 1981 (1981-03-24) claim 1 -----	1,10-12
A	US 5 905 657 A (CELNIKER GEORGE WILLIAM) 18 May 1999 (1999-05-18) column 4, line 37 - line 47; claim 1 -----	16
A	WO 00/13046 A (REES DAVID CHRISTOPHER ; NORGES GEOTEKNISKE INST (NO); WESTERDAHL HARA) 9 March 2000 (2000-03-09) claim 1 -----	16

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB2004/001877

Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-15

A method of analysing results from an electromagnetic survey.

2. claims: 16-19

A method of planning an electromagnetic survey.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB2004/001877

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5955884	A	21-09-1999	CA 2155691 A1	16-02-1996
			GB 2292460 A ,B	21-02-1996
			NO 953079 A	16-02-1996

US 2003048105	A1	13-03-2003	GB 2378511 A	12-02-2003
			BR 0203110 A	03-06-2003
			NO 20020203 A	30-05-2002
			NO 20023704 A	10-02-2003
			US 2004150404 A1	05-08-2004

US 2003043692	A1	06-03-2003	AT 268915 T	15-06-2004
			AU 3039201 A	14-08-2001
			BR 0108016 A	29-10-2002
			CA 2399051 A1	09-08-2001
			CN 1406340 T	26-03-2003
			DE 60103736 D1	15-07-2004
			EG 22924 A	30-11-2003
			EP 1256019 A1	13-11-2002
			EP 1460455 A1	22-09-2004
			WO 0157555 A1	09-08-2001
			NO 20023656 A	30-09-2002
			TR 200401587 T4	21-09-2004

WO 0214906	A	21-02-2002	AT 263383 T	15-04-2004
			AU 7858001 A	25-02-2002
			BR 0113208 A	01-07-2003
			CA 2417832 A1	21-02-2002
			CN 1447924 T	08-10-2003
			DE 60102595 D1	06-05-2004
			DK 1309887 T3	07-06-2004
			EG 22885 A	30-10-2003
			EP 1309887 A1	14-05-2003
			WO 0214906 A1	21-02-2002
			NO 20020201 A	02-04-2002
			PT 1309887 T	31-08-2004
			US 2004027130 A1	12-02-2004

US 4258322	A	24-03-1981	FR 2390743 A1	08-12-1978
			CA 1101063 A1	12-05-1981

US 5905657	A	18-05-1999	CA 2275398 A1	25-06-1998
			DE 69725468 D1	13-11-2003
			DE 69725468 T2	22-07-2004
			EP 0951652 A2	27-10-1999
			US 6256603 B1	03-07-2001
			WO 9827444 A2	25-06-1998

WO 0013046	A	09-03-2000	AU 769717 B2	05-02-2004
			AU 5634799 A	21-03-2000
			BR 9913259 A	22-05-2001
			CA 2340733 A1	09-03-2000
			CN 1316058 T	03-10-2001
			EP 1108226 A1	20-06-2001
			WO 0013046 A1	09-03-2000
			ID 28700 A	28-06-2001
			MX PA01002126 A	27-03-2003
			NO 20010994 A	27-04-2001
			US 2004124842 A1	01-07-2004

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB2004/001877

Patent document
cited in search report

Publication
date

Patent family
member(s)

Publication
date

WO 0013046

A

US

6628119 B1

30-09-2003

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

To:

see form PCT/ISA/220

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/GB2004/001877

International filing date (day/month/year)
30.04.2004

Priority date (day/month/year)
10.06.2003

International Patent Classification (IPC) or both national classification and IPC
G01V3/12

Applicant
OHM LIMITED

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1 (a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1 bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



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Lorne, B

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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/GB2004/001877

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
☐ a sequence listing
☐ table(s) related to the sequence listing
 - b. format of material:
☐ in written format
☐ in computer readable form
 - c. time of filing/furnishing:
☐ contained in the international application as filed.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/GB2004/001877

Box No. II Priority

1. ☒ The following document has not been furnished:

- ☒ copy of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(a)).
- ☐ translation of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

Box No. IV Lack of unity of invention

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees, the applicant has:

- ☒ paid additional fees.
- ☐ paid additional fees under protest.
- ☐ not paid additional fees.

2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is

- ☐ complied with
- ☒ not complied with for the following reasons:

see separate sheet

4. Consequently, this report has been established in respect of the following parts of the international application:

- ☒ all parts.
- ☐ the parts relating to claims Nos.

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/GB2004/001877

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-11,16-19
	No: Claims	12,14,15
Inventive step (IS)	Yes: Claims	1-11,16-19
	No: Claims	13-15
Industrial applicability (IA)	Yes: Claims	1-19
	No: Claims	

2. Citations and explanations

see separate sheet

Re Item IV

Lack of unity of invention

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims : 1-15

A method of analysing results from an electromagnetic survey.

2. claims : 16-19

A method of planning an electromagnetic survey.

The prior art US 2003/0048105 discloses (the references in parenthesis applying to this document) a method of analysing results from an electromagnetic survey of an area that is thought or known to contain a subterranean reservoir (paragraph 14) comprising the following steps:

- providing horizontal electric dipole (HED) response data obtained by at least one HED detector (paragraph 38) detecting a signal from a vertical electric dipole (VED) transmitter (paragraphs 31,38);
- providing background data specific to the area being surveyed (paragraph 37);
- comparing the response data with the background data to obtain difference data sensitive to the presence of a subterranean hydrocarbon reservoir (claim 1).

From the above, the objective problem may be regarded as a method for performing surveys in shallow water with detectors which are not sensitive to airwave components. This problem is solved by the features of the first set of claims that are not disclosed by the prior art document.

The Special Technical Feature of subject 1 as defined in Rule 13(2) PCT is : the vertical orientation of the detector and the horizontal orientation of the transmitter.

The second set of claims yields the non-disclosed potential Special Technical Feature as defined in Rule 13(2) (which have not been disclosed by the prior art document) of the planning of an electromagnetic survey.

The problem to be solved here could thus be said to be the provision of a method of

selecting optimum surveying conditions in terms of the transmitter-to-detector distance and the frequency of EM signal.

Consequently, there are no technical features in the claimed inventions which can be seen as common or corresponding special technical features within the meaning of Rule 13(2) PCT, which could serve as the basis of establishing unity between the 2 different inventions. It is also clear from the above discussion that the Special Technical Feature characterizing any one invention does not contribute to the solution of the objective problem of the other invention. No further features are available by means of which a relationship between the subjects of the 2 claimed inventions may be established. Consequently, neither the objective problems underlying the subjects of the 2 claimed inventions, nor their solutions defined by the (special) technical features allow for a relationship to be established between the said inventions. Hence, these 2 inventions are not linked by a single general inventive concept, and therefore the application does not meet the requirements of Unity of Invention as defined in Rule 13(i) and (ii) PCT.

Re Item V.

1 The following documents are referred to in this communication:

D1 : US 5 955 884 A (TABAROVSKY LEONTY A ET AL) 21 September 1999
(1999-09-21)

D2 : US 2003/048105 A1 (WESTERDAHL HARALD ET AL) 13 March 2003
(2003-03-13)

D3 : US-A-5 905 657 (CELNIKER GEORGE WILLIAM) 18 May 1999 (1999-05-18)

2 INDEPENDENT CLAIM 12

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 12 is not new in the sense of Article 33(2) PCT.

Document D1 discloses (the references in parenthesis applying to this document) an

electromagnetic survey method for an area that is thought or known to contain a subterranean hydrocarbon reservoir (column 1, lines 14-16) comprising the following steps:

- deploying a horizontal electric dipole (HED) transmitter (fig.4) and at least one receiver, the receiver including a vertical electric dipole (VED) detector (fig.5);
- collecting from the at least one VED detector VED response data induced by the HED transmitter.

Remark : the VED detector (E_z) measures the current induced by the HED transmitter (E_x or E_y)

Dependent claims 13-15 do not contain any features which, in combination with claim 12, meet the requirements of the PCT in respect of novelty or inventive step (Article 33(2) and (3) PCT).

2 INDEPENDENT CLAIM 1

Document D2, which is considered to represent the most relevant state of the art, discloses (the references in parenthesis applying to this document) a method of analysing results from an electromagnetic survey of an area that is thought or known to contain a subterranean reservoir (paragraph 14) comprising the following steps:

- providing horizontal electric dipole (HED) response data obtained by at least one HED detector (paragraph 38) detecting a signal from a vertical electric dipole (VED) transmitter (paragraphs 31,38);
- providing background data specific to the area being surveyed (paragraph 37);
- comparing the response data with the background data to obtain difference data sensitive to the presence of a subterranean hydrocarbon reservoir (claim 1).

From this, the subject-matter of independent claim 1 differs in that the detector is orientated vertically and the transmitter is orientated horizontally.

The subject-matter of claim 1 is therefore novel (Article 33(2) PCT). The problem to be solved by the present invention may be regarded as a desire to perform surveys in shallow water with detectors which are not sensitive to airwave components.

The solution to this problem proposed in claim 1 of the present application is

considered as involving an inventive step (Article 33(3) PCT) for the following reasons. In document D2 refracted airwaves are removed by subtraction between time-lapse surveys but the detectors are sensitive to the airwaves. Therefore, this method is less accurate since experimental conditions are difficult to reproduce from one survey to a second survey. In document D1, a horizontal electric dipole transmitter (Ex) and a vertical dipole receiver (Ez) are used in a multi-axis module. However, the problem to be solved is different and the vertical component (Ez) is not analysed in response to the signal transmitted by the horizontal electric dipole in order to obtain difference data sensitive to the presence of a subterranean hydrocarbon reservoir.

Claims 2-9 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

3 INDEPENDENT CLAIMS 10,11

These claims refer to a computer program and computer apparatus loaded with instructions for implementing the method of claim 1. Therefore, claims 10,11 meet the requirements of the PCT with respect to novelty and inventive step.

4 INDEPENDENT CLAIM 16

Document D3, which is considered to represent the most relevant state of the art, discloses (the references in parenthesis applying to this document) a method of planning an electromagnetic survey of an area that is thought or known to contain a subterranean reservoir (column 4, lines 4-7; lines 44-48) comprising the following steps:

- creating a model of the area to be surveyed with geological data and material properties
- adjusting the model to reduce the difference between the synthetic data and the acquired data.

From this, the subject-matter of independent claim 16 differs in that the vertical electric dipole response data is calculated for a signal emitted by a simulated horizontal electric dipole and in that the background data for comparison with the VED response data is obtained by adjusting the model to remove the postulated hydrocarbon reservoir.

The subject-matter of claim 16 is therefore novel (Article 33(2) PCT).

The problem to be solved by the present invention may be regarded as selecting optimum surveying conditions in terms of the transmitter-to-detector distance and the frequency of EM signal.

The solution to this problem proposed in claim 16 of the present application is considered as involving an inventive step (Article 33(3) PCT) since the comparison between the VED response data and simulated background data is neither known from, nor rendered obvious by, the available prior art.